DECLARATION

I declare that, apart from the assistance acknowledged, this report, titled:

"A case study of South Africa's teachers' understandings of the nature of science and classroom instructional practices" is my own work. All sources that I have used or quoted have been acknowledged by means of complete citation and referencing. This report is being submitted to the University of the Witwatersrand in partial fulfillment of the requirements for the degree of Masters of Science in Science Education. It has not been previously submitted for any degree or examination at any other university.

_____ _____

N.J. BEAUCHAMP **DATE**

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May God bless everyone who was involved in this study!

DEDICATION

This study is dedicated to my husband, Zwelibanzi; for his unwavering support and encouragement throughout the writing of this report and to my beloved daughters Yolisa, Lusanda and Nikiwe, for their understanding and Ousi, for her support.

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LIST OF ACRONYMS USED IN THE STUDY

LO - Learning outcome

NCS - National Curriculum Statements

NOS - Nature of Science

NOSS - Nature of Science Scale

OBE - Outcomes Based Education

TOUS - Test on Understanding Science

VNOS - Views of Nature of Science

WISP - Wisconsin Inventory of Science Processes

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A case study of South Africa teachers' understandings of the nature of science and classroom instructional practices

Julia Beauchamp

ABSTRACT

This study investigated South Africa's secondary school teachers' understandings of the nature of science (NOS) in relation to their instructional practices. The participants were three Grade 10 Physical Science teachers conveniently selected from three schools in the Gauteng province of South Africa. Teacher understandings of the nature of science were elicited through semi-structured interviews. The core questions for the interviews were adapted from the Views of Nature of Science Questionnaire (VNOS) – Form C developed by Abd-El-Khalick, Lederman, Bell and Schwartz (2002). The nature of science tenets explored were: what is science?: the role and purpose of experiments in science: the difference between scientific theories and laws in science and how scientists settle scientific disputes. Teacher instructional practices were ascertained through semi-structured interviews and lesson observations. The results were analyzed using a combination of typological analysis and interpretive analysis. These results show that on the selected NOS tenets, the sampled teachers hold a mixture of naïve and sophisticated understandings. These understandings are, however, largely naïve. It was found that the teachers only teach about NOS implicitly. None of the teachers was found to explicitly teach about the NOS. It also came out that the teachers were experiencing difficulties in both interpreting and implementation of Learning Outcome 3 of South Africa's new science curriculum. It is concluded that the interaction between teachers' NOS understandings and their instructional practices occurs without the teachers being aware of it, i.e. unconsciously. Recommendations for teaching, curriculum implementation and future research are suggested.

Key words

nature of science, instructional practices, teachers, scientific literacy, positivism, constructivism, curriculum, learning outcomes